

10/2018

[Dart Hawkesbury] Job Sheet - White, Jesse

mip



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200
Fax 613 632-5246

D350-748-201
Job Sheet 184483



POSITIVE RECALL

EFFECTIVE 12/10/17 AUTH 4
RELEASED 9 DATE 5-10-31
Eng approved reg'd

Part No: D350-748-201

Job Qty: 1 ea

Part Name: Aft Crosstube AS350 / AS355



Part Weight: 0 lbs

Status: New

Job Created: 10/10/18

Job Tracking No:

Due Date: 10/12/18

Created By: Jesse White

Type: SOLD

Description:

Note: DWG REV H IPP Rev: A New Issue 06-07-05 JLM IPP Rev: B Update qty of MS21042L5 06-09-12 KJ IPP Rev C Combined manufacturing 08.04.02 EC verified: DD IPP Rev: D 08-06-24 revD as per dwg DD verified: EC IPP Rev: E 08.12.11 Step 17 was step 21 KJ Verified: EC IPP Rev: F 10.08.04 added QSI010 4.3 DD ver: EC IPP REV: G ADD UNDER BEND COMMENT 12-05-28 JLM IPP REV: H 12.11.05 as per dwg D350-748-141G DD ver: JLM IPP REV: I 15.03.19 as per dwg D350-748-241revH dd ver: jlm

Ship Via:

Bill of Materials



1270 ABERDEEN ST
HAWKESBURY, ON K6A 1K7
CANADA
TEL.: 1 613 632-5200
Email: sales@dartaero.com
www.dartaerospace.com

Container No: S117537



Part: D350-748-201

Job No: 184483

Serial No/Batch: S117537

Revision:

Inspector:

Exp Date:

Instructions: TC STC SH06-27 Issue 2, FAA STC SR02359NY 11/03/04, EASA S

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup hrs	Run hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea	10/12/18	10/12/18	0.00	0.00	Start Up Crosstubes-1		DPZ
110	CNC Bend Crosstubes	1 pcs	10/12/18	10/12/18	0.00	2.94	CNC Bend Crosstube		DPZ
120	Crosstubes	1 pcs	10/12/18	10/12/18	0.00	2.65	Crosstubes-2		DPZ
125	Outsource	1 pcs	10/12/18	10/12/18			MEI001-VC	8	DPZ
126	Packaging	1 pcs	10/12/18	10/12/18	0.00	0.00	Packaging2		DPZ
127	QC	1 pcs	10/12/18	10/12/18	0.00	0.00	QC15		DPZ
128	Crosstubes	1 pcs	10/12/18	10/12/18	0.00	2.65	Crosstubes-2		DPZ
130	Crosstubes	1 pcs	10/12/18	10/12/18	0.00	1.85	Crosstubes-2		DPZ
140	QC	1 pcs	10/12/18	10/12/18	0.00	0.00	QC6		DPZ
150	Outsource	1 pcs	10/12/18	10/12/18			CAD002-VC	8	DPZ
160	Packaging	1 pcs	10/12/18	10/12/18	0.00	0.00	Packaging2		DPZ
170	QC	1 pcs	10/12/18	10/12/18	0.00	0.00	QC6		DPZ
174	Outsource	1 pcs	10/12/18	10/12/18			SKY002-VC	5	DPZ
176	Packaging	1 pcs	10/12/18	10/12/18	0.00	0.00	Packaging2		DPZ
178	QC	1 pcs	10/12/18	10/12/18	0.00	0.00	QC5		DPZ
180	SprayPaint	1 pcs	10/12/18	10/12/18	0.00	0.88	Spray Paint		DPZ
190	QC	1 pcs	10/12/18	10/12/18	0.00	0.00	QC14		DPZ
200	Crosstubes	1 pcs	10/12/18	10/12/18	0.00	1.85	Crosstubes-2		DPZ
210	QC	1 pcs	10/12/18	10/12/18	0.00	0.00	QC5		DPZ
220	Packaging	1 pcs	10/12/18	10/12/18	0.00	0.00	Packaging1-3		DPZ
230	QC	1 pcs	10/12/18	10/12/18	0.00	0.00	QC4		DPZ
240	Packaging	1 pcs	10/12/18	10/12/18	0.00	0.00	Packaging3-1		DPZ
245	DC	1 pcs	10/12/18	10/12/18	0.00	0.00	DC		DPZ
250	QC21-FG	1 Ea	10/12/18	10/12/18	0.00	0.00	QC21		DPZ

Part Op 110 - Bend tube as per Dwg D350-748-241 using CNC bender program D350A and Folio FT
Descriptions: .225" PER SIDE*****

120 - ****VERIFY CROSSTUBE DIMENSIONS AS PER DWG****

125 - ISSUE P/O TO METCOR: 41328 AFTER BENDING: STRESS RELIEF AT 650° F ± 25° F FOR A MINIMUM OF 2 HRS AIR COOL TO AMBIENT TEMPERATURE note: crosstube made from 4130 seamless steel tube DETAIL C OF C REQUIRED

127 - ***MARK CUT LINES***

128 - CUT TUBE AT HEIGHT ON FAI SHEET TWIST: 0.06 OCT 11 2018 CD 1

130 - 2- Drill Tube as per Dwg D350-748-241 Using DT8876 Drill Jigs, 3 -Deburr 4- Engrave Part # and Batch # as per Dwg D350-748-241 5-Remove all marks from tube within limits of D350-748-241 OCT 18 2018 CD

150 - Issue P/O: 41374 Stress relief at 375degree for 5hrs Magnetic Particle Inspect per ASTM E1444 Cad Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375 degree for 8 hrs, Chromate Treat C of C req'd

160 - Ensure certificate of conformity is attached

174 - ISSUE P/O TO SKYSERVICE: 00011475

180 - 1-Prime inside and out crosstube as per QSI 005 4.2

190 - Then,Wrap in plastic bag to protect from scratches

200 - INSTALL GROUND WIRE INSERT, THEN INSERT SCREW AND WASHER 2-Install supports with Proseal 890 per D350-748-241 and QSI 015 EXP: 3-Install supports clamps Using Dt8876 as per Dwg D350-748-241,Torque to 60-80 IN-LBS.

240 - Identify and pack for shipping as per PPPD350-748-201 PPP Rev:

245 - Photocopy bluefile & type labels per PPPD350-748-201 CHG003

Proseal Batch 55096394 EA 3/19
Start 18/10/30 Finish 18/11/02

Outsource 185: P004524 CD OCT 31 2018

Rec'd OCT 31 2018

180 Outsource Spray Paint P/O:

POSITIVE
RECALL

Dim
check.

POSITIVE
RECALL

Job BOM				
Part / Item	Component Name	Quantity	Operation	Container
D350-748-241TRN	Crosstube Turning Detail	1 Ea (1 ea)	90-Start up Operation	5104 048
ALS4-1032-225	Rivnut	1 Ea (1 ea)	200-Crosstubes	
D3502-1	Support	2 Ea (2 ea)	200-Crosstubes	
D5123-7	Clamp Cushion	2 Ea (2 ea)	200-Crosstubes	
MS21920-20	Clamp	2 Ea (2 ea)	200-Crosstubes	
MS27039-1-10	Screw	1 Ea (1 ea)	200-Crosstubes	
NAS1149D0363J	Washer	1 Ea (1 ea)	200-Crosstubes	
AN4-41A	Bolt	8 Ea (8 ea)	220-Packaging	205 898 143
AN4-6A	Bolt	16 Ea (16 ea)	220-Packaging	5053946
AN5-32A	Bolt	4 Ea (4 ea)	220-Packaging	5058982-11
D3500-1	Saddle	4 Ea (4 ea)	220-Packaging	5018231
D3501-1	Bushing	16 Ea (16 ea)	220-Packaging	5094589
MS21042L4	Nut	24 Ea (24 ea)	220-Packaging	5094592
MS21042L5	Nut	4 Ea (4 ea)	220-Packaging	5093592
NAS1149D0463J	Washer	32 Ea (32 ea)	220-Packaging	5092750
NAS1149D0563J	Washer	8 Ea (8 ea)	220-Packaging	5050053

Job Allocations				
Operation	Component Part	Required	Inventory	Allocated
90-Start up Operation 200-Crosstubes	D350-748-241TRN	1	5	0
	ALS4-1032-225 <i>km 134579-60</i>	1	1,843	0
	D3502-1 <i>F 163 944</i>	2	38	0
	D5123-7 <i>163 264</i>	2	301	0
	MS21920-20 <i>5034404</i>	2	200	0
	MS27039-1-10 <i>507 1834</i>	1	204	0
	NAS1149D0363J <i>5095293</i>	1	1,829	0
220-Packaging	AN4-41A	8	567	0
	AN4-6A	16	1,198	0
	AN5-32A	4	354	0
	D3500-1	4	103	0
	D3501-1	16	547	0
	MS21042L4	24	4,639	0
	MS21042L5	4	733	0
	NAS1149D0463J	32	5,614	0
	NAS1149D0563J	8	1,414	0

Part Specifications

Specifications could not be found.

Plex 10/10/18 12:57 PM dart.white.jesse

Item	Qty	Part Number	Description
	-241		
1	X	D350-748-241	CROSS TUBE ASSEMBLY (AS 350353 HI AFT)
2	1	D6015-125	CROSS TUBE (OR D6018-125)
3	2	D3502-1	SUPPORT
4	2	D5123-7	CLAMP CUSHION
5	1	AELS-1032-225	INSERT
6	1	NAS1148D0363J	WASHER (OR AN980JD10)
7	2	MS21920-20	CLAMP (OR MS21920-21-22, PER DART SPEC.
		M-MS21920-21-22)	
8	1	MS27098-1-10	SCREW
9	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8902 CLASS B-2

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6015-125 OR D6018-125
- 2) FINISH: FINISHED LENGTH AFTER TURNING = 124.70±0.06 (AFTER BENDING/TRIMMING = 122.70 REF)
MAGNETIC PARTICLE INSPECT PER DART CSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART CSI 005 4.2
PAINT OUTSIDE PER DART CSI 005 4.2
- 3) TOLERANCE: PER DART CSI 016 UNLESS OTHERWISE NOTED.
WALL THICKNESS ECCENTRICITY PER DART CSI 038 7.2
MIN. ALLOWABLE WALL IS -0.020 FROM NOMINAL
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: DART PART NUMBER "D350-748-241" AND BATCH NUMBER ON INSIDE OF CLIFF
PER DART CSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 28.85 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR 60.267 HOLE.
- 9) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLEND OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
- 10) BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6738 OR AMS2759/IE AFTER TURNING. ACCEPTABLE TO VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.
- BENDING
12) ALL DIMENSIONS FOR BENT TUBE ARE POST STRESS RELIEF
13) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES PER SIDE. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D. ON TOP HALF OF BEND, AND 8% ON BOTTOM HALF OF BEND.
14) MAX AMPLITUDE OF RIPPLING ALONG BENT PORTION OF THE TUBE IS 0.030 (2N A1-3)
15) AFTER BENDING, STRESS RELIEVE TUBE AT 650°F ±0.25°F FOR A MINIMUM OF 2 HRS AND ALLOW TO COOL TO AMBIENT TEMPERATURE (REF AMS2759/IE).
- 16) MAX TWIST AFTER STRESS RELIEF: WITH TUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN CLIFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.38 (2N C1-3).
- ASSEMBLY
17) TO INSTALL D3502-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSS TUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.02" TO 0.05" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8902 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
18) TORQUE CLAMPS 80 TO 90 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TIGHTENING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

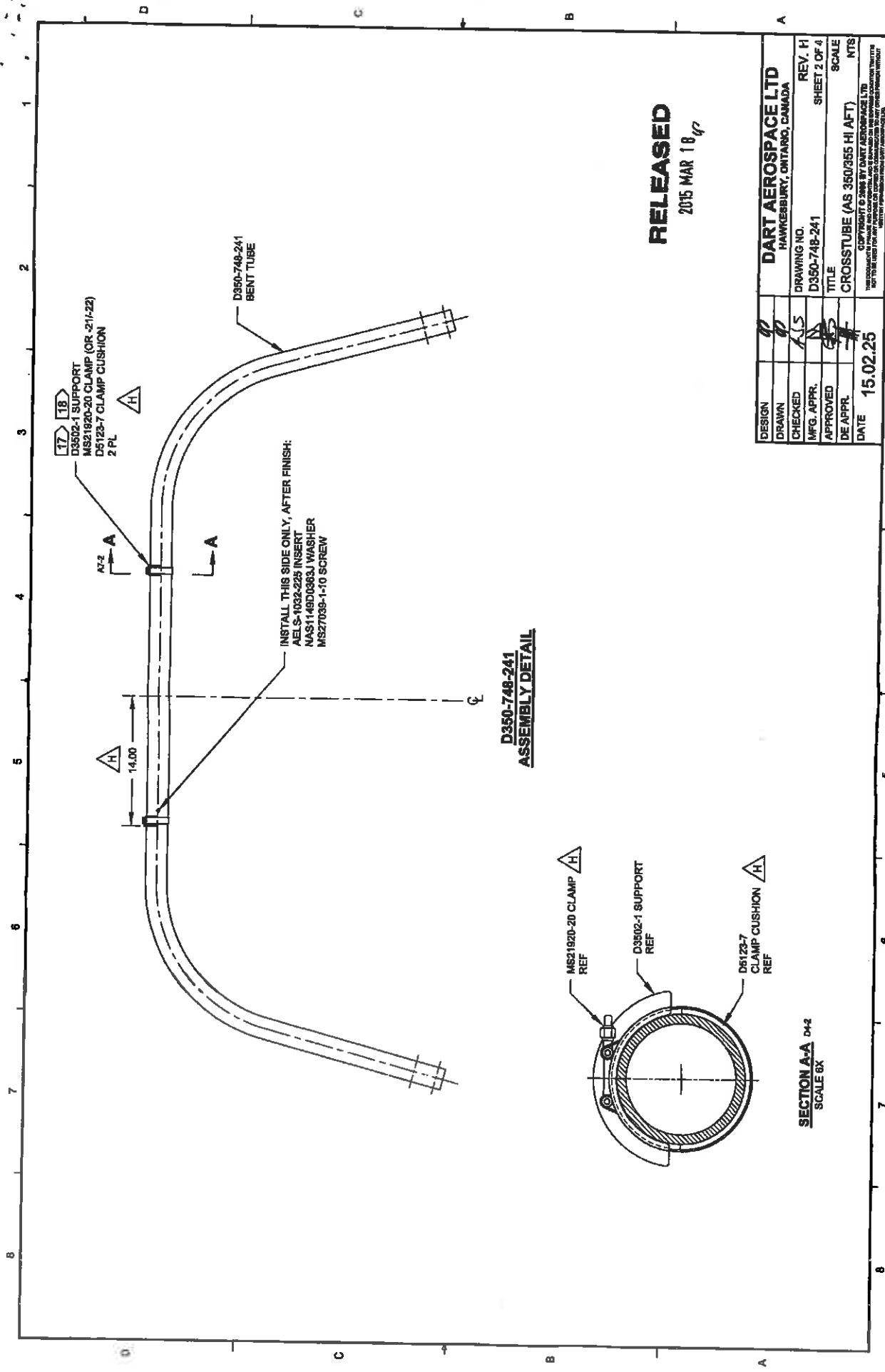
RELEASED

2015 MAR 18

90 244 45547

H	D5123-7 WAS D3502-083-308, MS21920-20 WAS -22, ALLOWABLE CRUSHING NOW 6% WAS 7%, 14.00 WAS 14.37 (D5-2), 12.35 WAS 12.09 (D6-3)	CP	18.02.23
G	RAV ABRASION STRIP, SUPPORT NOW W/ PROSEAL & CUSHION, ADD STRESS RELIEF, LONGER CLIFF, NOW TRIMD AFTER BEND, ADD WALL DING & UPDATE TOL	CP	12.08.12
F	ADD HRC TEST OPTION (D6-1) PER PAR 00-040, ADD TWIST LIMIT (A6-1, C1-3), ADD D6015-125 OPTION (C2-1), STOCK DIM NOW MACHINED (D1-4)	CP	10.11.23
E	REPAIR GENERAL NOTES: UPDATE TO CURRENT STANDARDS, RELOCATED FLAG #6 PER PAR 00-046 (2N A5-3), ADD TOLERANCES (2N C5-3, D2-3)	RF	09.09.30
D	WGL PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.10
B	ADD D6018-125 & PRIME AND PAINT	CP	06.03.31
A	NEW ISSUE	BY	DATE
DESIGN	DESCRIPTION		
DRAWN	DART AEROSPACE LTD HARRISBURG, ONTARIO, CANADA		
CHECKED	A/S	DRAWING NO.	REV. H
MFG. APPR.	M	D350-748-241	SHEET 1 OF 4
APPROVED		TITLE	SCALE
DATE	15.02.25	CROSS TUBE (AS 350353 HI AFT)	NTS

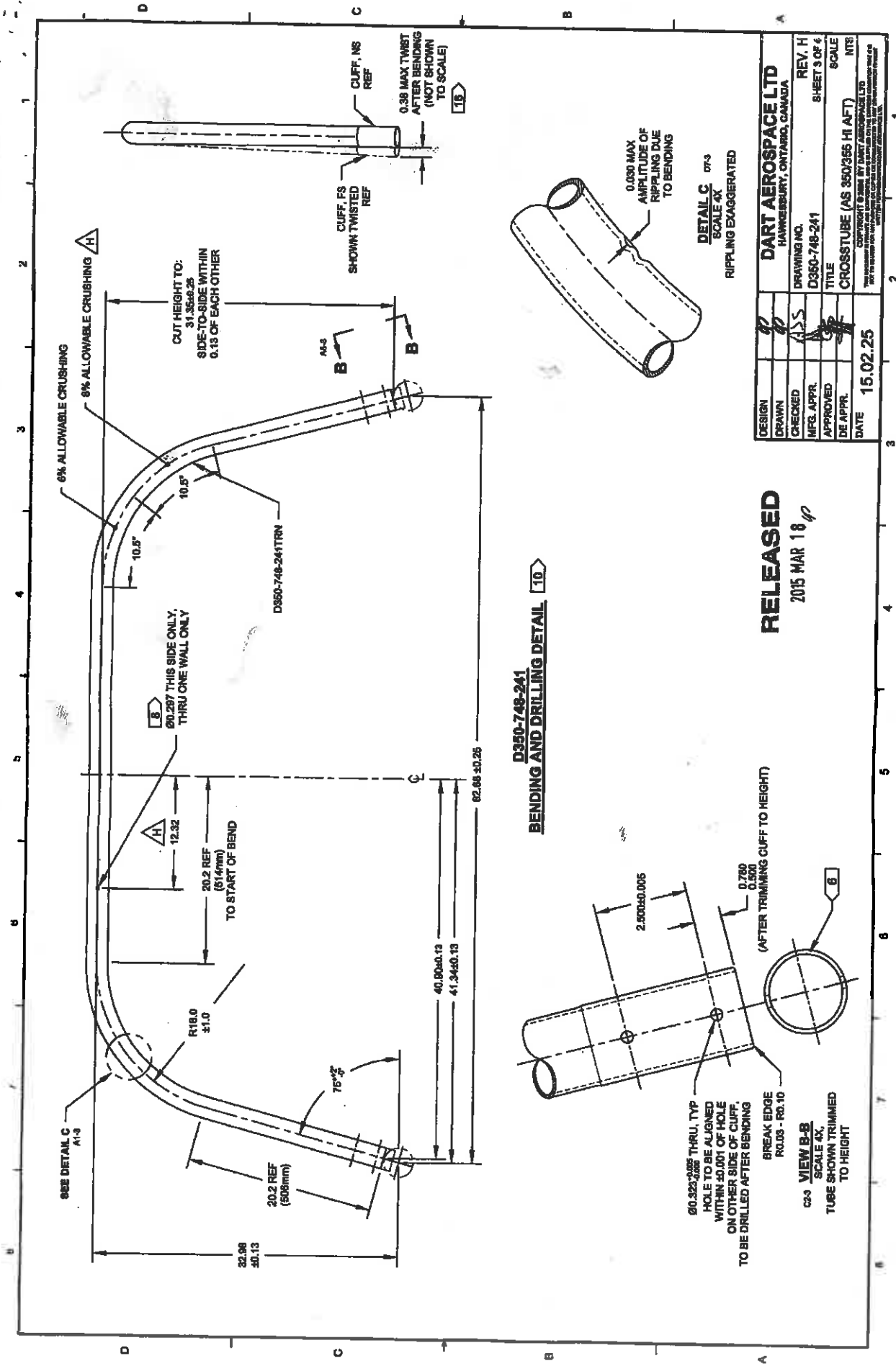
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2015 MAR 18 07

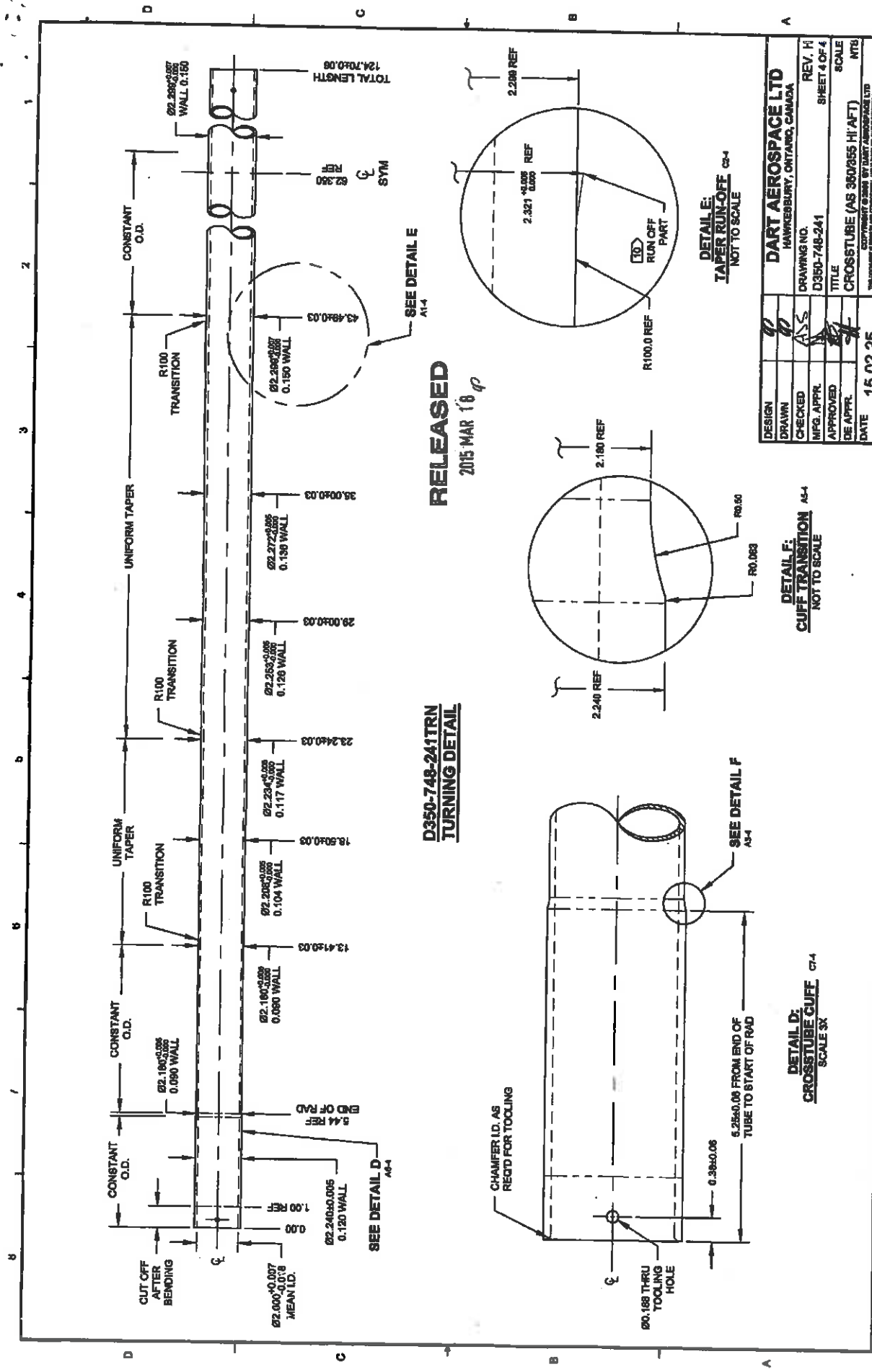
DESIGN	00	DART AEROSPACE LTD
DRAWN	00	HAWKESBURY, ONTARIO, CANADA
CHECKED	ALS	DRAWING NO.
MFG. APPR.	N	D350-748-241
APPROVED	00	REV. H
DE APPR.	00	SHEET 2 OF 4
DATE	15.02.25	TITLE
		CROSSTUBE (AS 350/355 HI AFT)
		SCALE
		NTS

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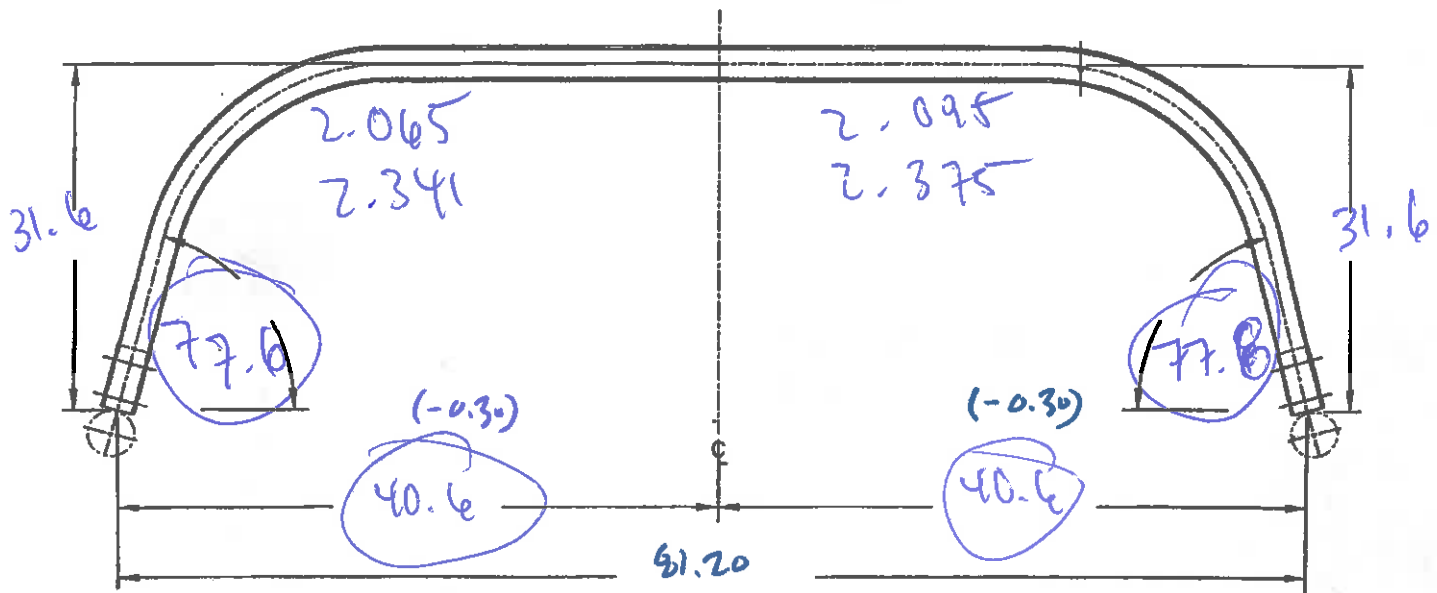
RELEASED
2015 MAR 18 *18*

DESIGN	10		DART AEROSPACE LTD HAWTHORNSBURRY, ONTARIO, CANADA
DRAWN	10		
CHECKED	10		
INFG. APPR.	10		
APPROVED	10		
DE APPR.	10		
DATE	15.02.25		



DART AEROSPACE LTD		Work Order:
Description: Crosstube High Aft (AS350/355)		Part Number: D350-748-201
Inspection Dwg: D350-748-241	Rev: H	Page 1 of 1

Required Dimension	Min	Max
Height	31.10	31.60
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.54	82.06
Bending Passes	7	--
Crushing	--	8%
Twist	--	0.38



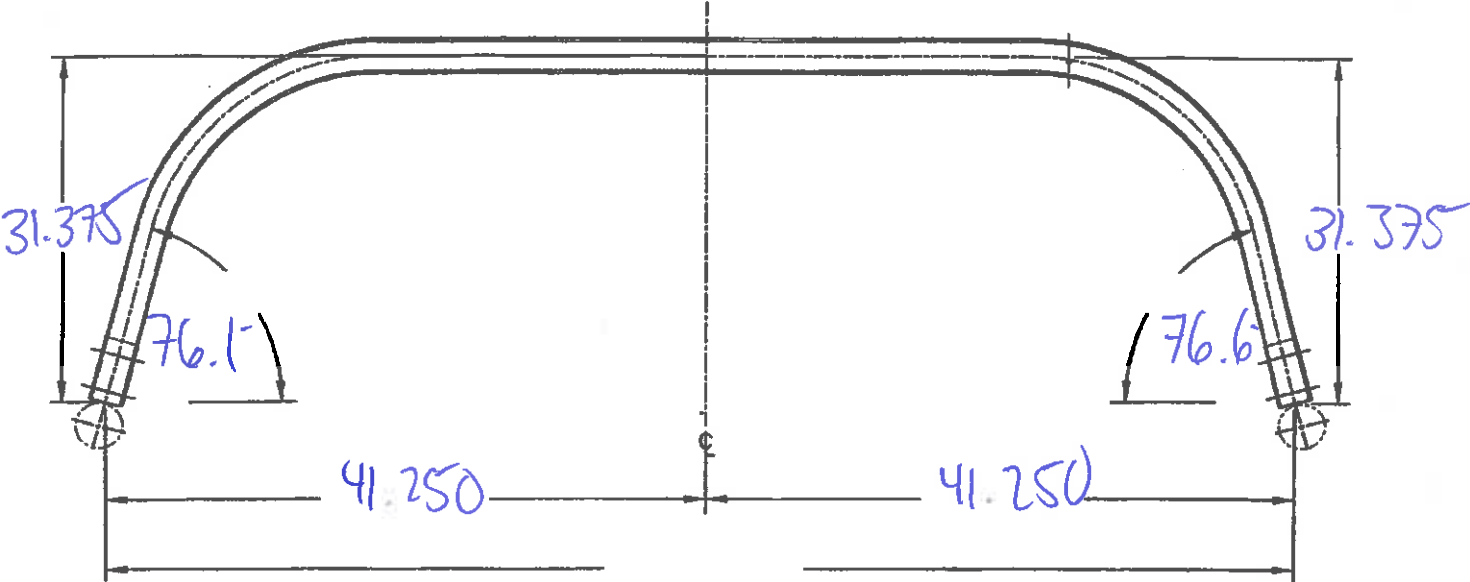
	Side A	Side B
Bending Passes		
Crushing	6.3%	6.3%
Comments		

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	
C	12.04.16	Added bending, crushing & twist dimensions	KJ	
D	12.07.31	Dwg Rev updated	KJ	
E	13.02.27	Dwg Rev updated	KJ	
F	14.02.13	Crushing & twist dimensions revised	KJ	
G	14.11.10	Height dimension revised	KJ	
H	15.07.20	Crushing dimension revised	KJ	

DART AEROSPACE LTD		Work Order:	
Description: Crosstube High Aft (AS350/355)		Part Number:	D350-748-201
Inspection Dwg: D350-748-241 Rev: H		Page 1 of 1	

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Crushing	--	8%
Twist	--	0.38



	Side A	Side B
Bending Passes		
Crushing		
Comments		

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	
C	12.04.16	Added bending, crushing & twist dimensions	KJ	
D	12.07.31	Dwg Rev updated	KJ	
E	13.02.27	Dwg Rev updated	KJ	
F	14.02.13	Crushing & twist dimensions revised	KJ	
G	14.11.10	Height dimension revised	KJ	
H	15.07.20	Crushing dimension revised	KJ	



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER

PO041328

Supplier: MEI001-VC
Metcor Inc.
560 Boul. Arthur Sauve
Saint-Eustache
QC
J7R 5A8 Canada
Phone: 450 473 1884
Fax: 450 491 5498

PO No: PO041328

PO Date: 10/11/18

Due Date: 10/12/18

**Purchase Order
Revision:**

Revision Date:

Ship-To Contact: Lavoie, Chantal
Phone: clavoie@dartaero.com

OCT 11 2018

E-MAILED

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

Via: Ground

Pymt Terms: Net 30

Freight Terms:

Special Comments:

Items

Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	184483	D350- 748-201	Aft Crosstube AS350 / AS355 : TC STC SH06-27 Issue 2, FAA STC SR02359NY 11/03/04, EASA STC EASA.10016903 Revision 2 10/09/03, BRAZIL 2009S04- 04 09/04/06 ISSUE P/O TO METCOR: AFTER BENDING: STRESS RELIEF AT 650° F ± 25° F FOR A MINIMUM OF 2 HRS AIR COOL TO AMBIENT TEMPERATURE note: crosstube made from 4130 seamless steel tube DETAIL C OF C REQUIRED	Firmed	-	10/12/18	1 pcs	0 pcs	1 pcs	\$205.00/pcs	\$205.00
	184480			Firmed	-	10/12/18	1 pcs	0 pcs	1 pcs	\$205.00/pcs	\$205.00
Sub Total:							2	0	2		\$410.00
Grand Total:											\$410.00

DAS
38
9-86

	Dart Aerospace Ltd. 1270 Aberdeen St Hawkesbury, ON K6A 1K7 Canada Tel (613) 632-5200	PURCHASE ORDER PO041328
Order Notes Procurement Quality Clauses A005 right of entry A012 chemical and physical test report A016 personnel qualification A017 raw material identification (as applicable) A022 Apical Processing A024 process certifications A026 certification of material conformance A041 quality management system A042 dart notification by supplier A043 retension of quality documents A048 counterfeit parts avoidance, detection, mitigation and disposition program A049 supplier awareness Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.		

Plex 10/11/18 2:59 PM dart.lavoie.chantal

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ
ST-EUSTACHE, QC J7R 5A8
Tel: 450-473-1884 / Fax: 450-491-5498

Recu de livraison

Delivery Receipt

BON DE TRAVAIL Order	EXPÉDITEUR Shipper ID	BON D'EXPÉDITION Shipper
331089	1	131578

EXPÉDITION COMPLÈTE / Shipped Complete

CLIENT /Customer 215

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
Ph: 613-632-5200
Fax: 613-632-1053



LIVRÉ À /Shipped To

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
Ph: 613-632-5200
Fax: 613-632-1053

COMMANDE DU CLIENT Customer PO	BON DE LIVRAISON DU CLIENT Customer Shipper No.	TYPE DE MATÉRIEL Material Type	DATE DE LA COMMANDE Order Date	TRANSPORTEUR Carrier
41328 ✓		Steel	2018/10/11	client

QUANTITÉ Quantity	No. PIÈCE / Part No.	NOM DE LA PIÈCE / Part Name	DESCRIPTION DE LA PIÈCE Part Description	POIDS Weight
2	D350-748-201			62,
	(2) D350-748-201	JOB 184480		
1	NIL			

TYPE DE CONTENEUR Container Type	# DE CONTENEURS # Of Containers	COMMENTAIRES CONTENEUR Container Comments
NIL	1	

EMPAQUETAGE Packing	
------------------------	--

QUANTITÉ EXPÉDIÉE / Quantity Shipped : 2
POIDS EXPÉDIÉ / Weight Shipped : 62,00
QUANTITÉ RESTANTE / Quantity Remaining : 0
POIDS RESTANT / Weight Remaining : 0,00

APPROUVE

QUANTITÉ EXPÉDIÉE Quantity Shipped:	2
POIDS EXPÉDIÉ / Weight Shipped :	62,00

Signature:

Date:

EXPÉDIÉ LE / Shipped On :2018/10/12

METCOR INC.

500 BOUL. ARTHUR SAUVÉ, ST-EUSTACHE, QC, J7R 5A3

Tél.: 450-473-1884

Télécopieur / Fax administration: 450-491-5498

Télécopieur / Fax production: 450-491-6454

Certificat de Conformité Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
331069	1

CLIENT / customer 215

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K6A-1K7

LIVRÉ À / shipped to:

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K6A-1K7

COMMANDE DU CLIENT customer po	CLASSIFICATION PIECE part classification	MATÉRIEL material	MAÎTRE D'OEUVRE prime contractor	PROGRAM
41328	N/A	Steel		

SPÉCIFICATIONS DU PROCÉDÉ

processing specifications

STRESS REL...

SAE AMS 2759/1 REV.F

EXIGENCE / requirement SPÉCIFICATIONS / specified TESTS EXÉCUTÉS / performed RÉSULTATS DE TESTS / results

Visual

QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description
2	62	D350-748-201 (2) D350-748-201 JOB 184480
		1 NIL

COMMENTAIRES / comments

APPROUVÉ par / Approved by:

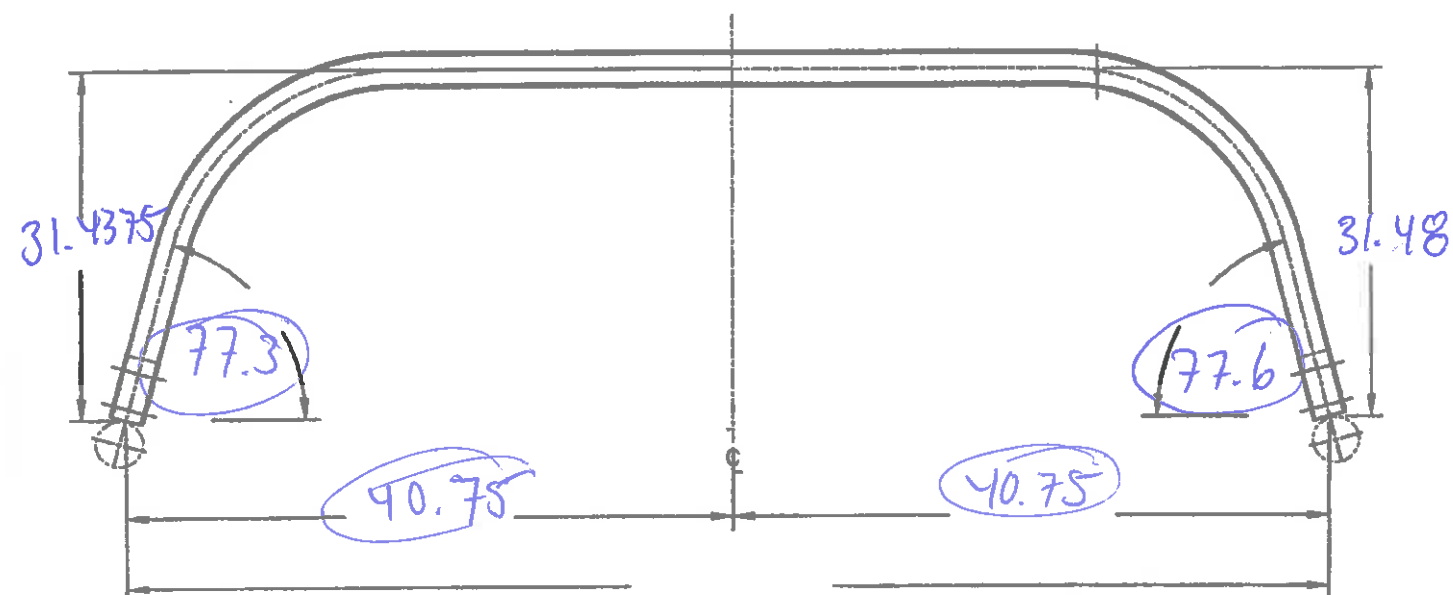
DATE: 2018-10-12

DAS
38
8-89

APPROUVÉ

DART AEROSPACE LTD		Work Order:	
Description: Crosstube High Aft (AS350/355)		Part Number:	D350-748-201
Inspection Dwg: D350-748-241 Rev: H		Page 1 of 1	

Required Dimension	Min	Max
Height	31.10	31.60
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.54	82.06
Bending Passes	7	—
Crushing	--	8%
Twist	--	0.38



	Side A	Side B
Bending Passes		
Crushing		
Comments		

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	
C	12.04.16	Added bending, crushing & twist dimensions	KJ	
D	12.07.31	Dwg Rev updated	KJ	
E	13.02.27	Dwg Rev updated	KJ	
F	14.02.13	Crushing & twist dimensions revised	KJ	
G	14.11.10	Height dimension revised	KJ	
H	15.07.20	Crushing dimension revised	KJ	

md 17 juln 2019

Job: 184483		DISPOSITION		DEPARTMENT/PROCESS				Route update only			
Part No. 030444-201		Rework ☐ Scrap ☐ Use-as-is ☒		Skid-tube ☐ Machining ☐ Large Fab ☐		Cross tube ☒ Small Fab ☐ Finishing ☐		Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐		Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐	
Date: 18/10/17		Sequence #: 127		QTY Affected: 1		MRB (QSI042)		12 18/10/17			
Description Work Order Deviation				Disposition							
Tube was over bent and was yielded in Eng deflection rig to bring it into tolerance.				Process will be approved by Eng. test. Acceptable to proceed with remaining work steps pending Eng approval. → Tube acceptable based on Eng test of S117S28 on 18/10/29							
Completed By: 18/10/17				Lead hand / Supervisor: 18-10-31							
DAS 9				QC / QA Coordinator: 18-10-31							
DAS 9				18-10-31							
Root Cause				FAULT CATEGORY							
Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☒ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐				Pressure/Forced ☐ Bending ☒ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☒ Marks/Chatter ☐ Mislabeled ☐ Other/Details: _____							
Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐				Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐							
Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread ☐											



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER **PO041374**

Supplier: CAD002-VC
Cadorath Coating
2150 Logan Ave.
Winnipeg
MB
R2R 0J2 Canada
Phone: 204 633 9420
Fax: 204 633 8033

PO No: PO041374
PO Date: 10/18/18
Due Date: 10/31/18

Purchase Order
Revision:
Revision Date:
Ship-To Contact: Phone:

E-MAILED
OCT 19 2018

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

Via: Ground
Pymt Terms: Net 30
Freight Terms:
Special Comments:

Items

Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	184476	D350-748-101	FWD Crosstube AS350 / AS355 : TC STC SH06-27 Issue 2, FAA STC SR02359NY 11/03/04, EASA STC EASA.10016903 Revision 2 10/09/03, BRAZIL 2009S04-04 09/04/06 Issue P/O: Stress relief at 375degree for 5hrs Magnetic Particle Inspect per ASTM E1444 Cad Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375 degree for 8 hrs, Chromate Treat C of C req'd serial # S117106	Firmed	-	10/31/18	1 pcs	0 pcs	1 pcs	\$805.00/pcs	\$805.00
184479			serial # S117081	Firmed		10/31/18	1 pcs	0 pcs	1 pcs	\$805.00/pcs	\$805.00
184478			serial # S117100	Firmed		10/31/18	1 pcs	0 pcs	1 pcs	\$805.00/pcs	\$805.00
Sub Total:							3	0	3		\$2,415.00



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER
PO041374

Items											
Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
2	184480	D350-748-201	Aft Crosstube AS350 / AS355 : TC STC SH06-27 Issue 2, FAA STC SR02359NY 11/03/04, EASA STC EASA.10016903 Revision 2 10/09/03, BRAZIL 2009S04-04 09/04/06 Issue P/O: Stress relief at 375degree for 5hrs Magnetic Particle Inspect per ASTM E1444 Cad Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375 defree for 8 hrs, Chromate Treat C of C req'd serial # S117528	Firmed	-	10/31/18	1 pcs	0 pcs	1 pcs	\$805.00/pcs	\$805.00
	184483		serial # S117537	Firmed		10/31/18	1 pcs	0 pcs	1 pcs	\$805.00/pcs	\$805.00
Sub Total:							2	0	2		\$1,610.00
Grand Total:										\$4,025.00	

Order Notes

Procurement Quality Clauses
A005 right of entry
A012 chemical and physical test report
A016 personnel qualification
A017 raw material identification (as applicable)

A022 Apical Processing
A024 process certifications
A026 certification of material conformance

A041 quality management system
A042 dart notification by supplier
A043 retension of quality documents

A048 counterfeit parts avoidance, detection, mitigation and disposition program

A049 supplier awareness

Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.

CG

Plex 10/18/18 10:24 AM dart.lavoie.chantal

DAS
36
9-86

Packing Slip



Cadorath Coating

2150 Logan Avenue, Winnipeg, Manitoba R2R-0J2
Phone: (204) 633-9420 Fax: (204) 633-8033

INVOICE NUMBER:
S98011

Net 2% Interest Per Month charged on Overdue Accounts.
Any claims for shortages, overcharges, or damaged goods must
be made within seven (7) days from receipt of goods.

Sold To:
Dart Aerospace Ltd.
1270 Aberdeen St.

Hawksbury, ON K6A 1K7

ShipTo:

Customer Order #:	DateReceived:	Terms:	G.S.T. #:	Ship Via:	Ship Date:
PO041374	Oct-19-2018	NET 30 DAYS	10071 6547 RT0001		Oct-25-2018

Item #	Qty	P/N & Description	
1	1 EA	CROSSTUBE ✓	S/N S117106 ✓
		P/N d350-748-101	W/O 187621
2	1 EA	CROSSTUBE ✓	S/N S117081 ✓
		P/N d350-748-101	W/O 187622
3	1 EA	CROSSTUBE ✓	S/N S117100 ✓
		P/N d350-748-101	W/O 187623
4	1 EA	CROSSTUBE ✓	S/N S117528 ✓
		P/N D350-748-201	W/O 187624
5	1 EA	CROSSTUBE ✓	S/N S117537 ✓
		P/N D350-748-201	W/O 187625

CERTIFICATE OF
CONFORMANCE

CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1

DATE: Oct-25-2018

CONSIGNED TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 187625
INVOICE #: 98011

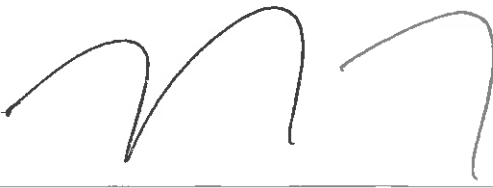
CONTRACT OR
PURCHASE ORDER # PO041374 ✓

DESCRIPTION:	CROSSTUBE	QTY	1 ✓
P/N #	D350-748-201 ✓	S/N #	S117537 ✓

STRESS RELIEF BAKE HEAT CHART # 18-980. MPI IAW ASTM-E-1444. CADMIUM PLATE IAW AMS-QQ-P-416C TYPE 2 YELLOW CLASS 1. FINAL MPI IAW ASTM-E-1444. EMBRITTLE RELIEF BAKE HEAT CHART # 18-990. STRESS RELIEF BAKE HEAT CHART # 18-980. MPI IAW ASTM-E-1444. CADMIUM PLATE IAW AMS-QQ-P-416C TYPE 2 YELLOW CLASS 1. FINAL MPI IAW ASTM-E-1444. EMBRITTLE RELIEF BAKE HEAT CHART # 18-990.

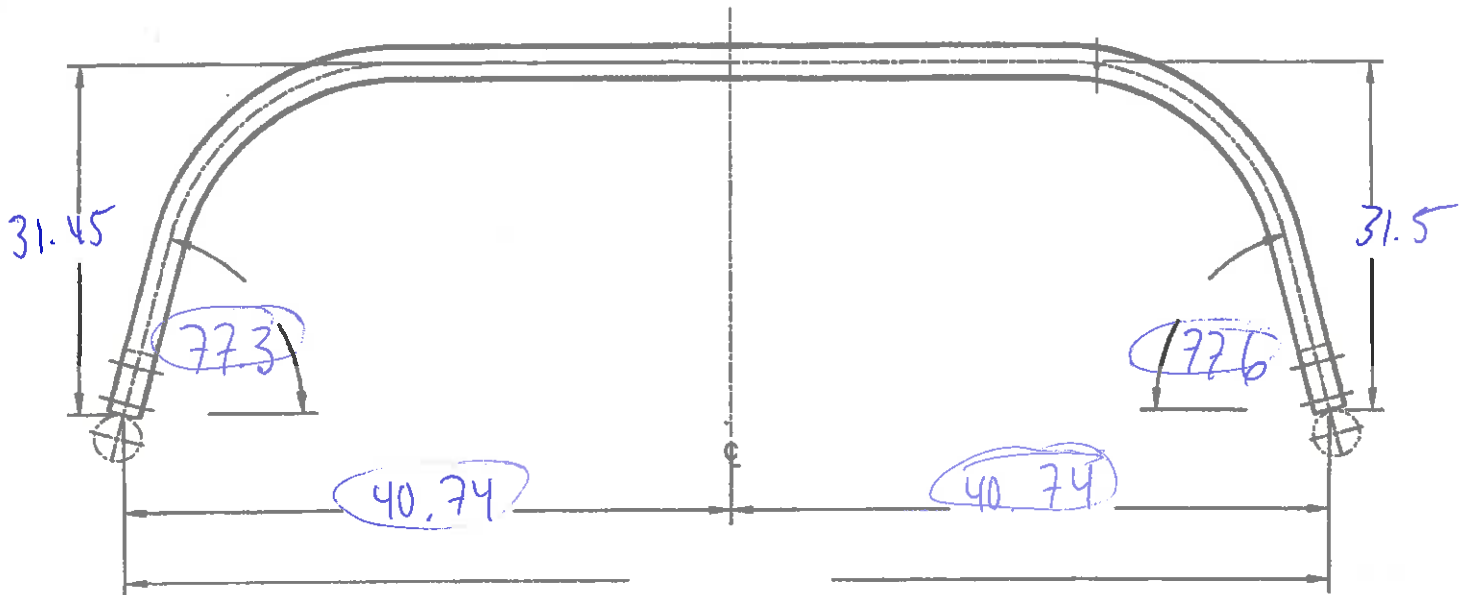
CERTIFICATE: I certify that the items indicated here on have been inspected and tested and conform to all specifications and requirements detailed on the contract or purchase order.

DAS
38
9-89

Approved Inspector:  

DART AEROSPACE LTD	Work Order:	
Description: Crosstube High Aft (AS350/355)	Part Number:	D350-748-201
Inspection Dwg: D350-748-241 Rev: H		Page 1 of 1

Required Dimension	Min	Max
Height	31.10	31.60
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.54	82.06
Bending Passes	7	--
Crushing	--	8%
Twist	--	0.38



	Side A	Side B
Bending Passes		
Crushing		
Comments		

QC15 Inspection	DAS 38
Date	9-80 OCT 26 1978

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	
C	12.04.16	Added bending, crushing & twist dimensions	KJ	
D	12.07.31	Dwg Rev updated	KJ	
E	13.02.27	Dwg Rev updated	KJ	
F	14.02.13	Crushing & twist dimensions revised	KJ	
G	14.11.10	Height dimension revised	KJ	
H	15.07.20	Crushing dimension revised	KJ	



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER PO041475

Supplier: SKY002-VC
Skyservice
6120 Midfield Road
Mississauga
ON
L5P 1B1 Canada
Phone: 905-678-5636
Fax: 905-678-5841

PO No: PO041475
PO Date: 10/26/18
Due Date: 10/30/18

**Purchase Order
Revision:**

Revision Date:

Ship-To Contact: Phone:

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

Via: Ground

Pynt Terms: Net 30

Freight Terms:

Special Comments:

Items

Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	184178	D4484-041	Fuel Tank Assembly Various STC's ISSUE P/O : LIQUID PENETRANT INSPECTION AS PER QSI 038 OR LPI AS PER ASTM 1417 LEVEL 2	Firmed -		10/30/18	1 pcs	0 pcs	1 pcs	\$156.00/pcs	\$156.00
			1X OCT 30 2018								
2	184697	D212-664-101	Fwd Crosstube - High TC STC SH01-9 Issue 3, FAA STC SR01298NY 09/01/08, EASA STC EASA.IM.R.S.01304 07/03/06, DGAC MEXICO STC IA-316/2015 15/06/17 *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	Firmed -		10/30/18	1 pcs	0 pcs	1 pcs	\$75.00/pcs	\$75.00
			1X OCT 30 2018								
	184695		1X OCT 30 2018	Firmed -		10/30/18	1 pcs	0 pcs	1 pcs	\$75.00/pcs	\$75.00
			Sub Total:				2	0	2		\$150.00
3	183769	D212-664-201	Aft Crosstube - High TC STC SH01-9 Issue 3, FAA STC SR01298NY 09/01/08, EASA STC EASA.IM.R.S.01304 07/03/06, DGAC MEXICO STC IA-316/2015 15/06/17 ***WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.*** Issue P/O: LIQUID PENETRANT INSPECTION AS PER QSI 038 OR LPI AS PER ASTM 1417 LEVEL 2	Firmed -		10/30/18	1 pcs	0 pcs	1 pcs	\$156.00/pcs	\$156.00
			1X OCT 30 2018								
	183770		1X OCT 30 2018	Firmed -		10/30/18	1 pcs	0 pcs	1 pcs	\$156.00/pcs	\$156.00



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER
PO041475

Items											
Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
Sub Total:							2	0	2		\$312.00
4	184479	D350-748-101	FWD Crosstube AS350 / AS355 : TC STC SH06-27 Issue 2, FAA STC SR02359NY 11/03/04, EASA STC EASA.10016903 Revision 2 10/09/03, BRAZIL 2009S04-04 09/04/06 Issue P/O: Stress relief at 375degree for 5hrs Magnetic Particle Inspect per ASTM E1444 Cad Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375 degree for 8 hrs, Chromate Treat C of C req'd ISSUE P/O TO SKYSERVICE:	Firmed	-	10/30/18	1 pcs	0 pcs	1 pcs	\$122.7272/pcs	\$122.73
	184476			Firmed	-	10/30/18	1 pcs	0 pcs	1 pcs	\$122.7272/pcs	\$122.73
	184478			Firmed	-	10/30/18	1 pcs	0 pcs	1 pcs	\$122.7272/pcs	\$122.73
Sub Total:							3	0	3		\$368.18
5	184480	D350-748-201	Aft Crosstube AS350 / AS355 : TC STC SH06-27 Issue 2, FAA STC SR02359NY 11/03/04, EASA STC EASA.10016903 Revision 2 10/09/03, BRAZIL 2009S04-04 09/04/06 ISSUE P/O TO SKYSERVICE:	Firmed	-	10/30/18	1 pcs	0 pcs	1 pcs	\$122.7272/pcs	\$122.73
	184483			Firmed	-	10/30/18	1 pcs	0 pcs	1 pcs	\$122.7272/pcs	\$122.73
Sub Total:							2	0	2		\$245.45
Grand Total: \$1,231.64											

DAS
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9-89

	Dart Aerospace Ltd. 1270 Aberdeen St Hawkesbury, ON K6A 1K7 Canada Tel (613) 632-5200	PURCHASE ORDER PO041475
Order Notes		
Procurement Quality Clauses A005 right of entry A012 chemical and physical test report A016 personnel qualification A017 raw material identification (as applicable) A022 Apical Processing A024 process certifications A026 certification of material conformance A041 quality management system A042 dart notification by supplier A043 retention of quality documents A048 counterfeit parts avoidance, detection, mitigation and disposition program A049 supplier awareness Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.		

Plex 10/29/18 8:56 AM dart.tsimiklis.chrisoula



Work Order Traveler
Sky Service F.B.O. Inc.

10105 Ryan Avenue, Dorval, Quebec, H9P 1A2
TCCA AMO 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO37958	Customer: Dart Aerospace Ltd.	Dept: NDT-YUL	Reference: PO041475
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN:	CSN:	TSO:	

Task: UNSCHEDULED	Sequence: 1
-------------------	-------------

Work Required:

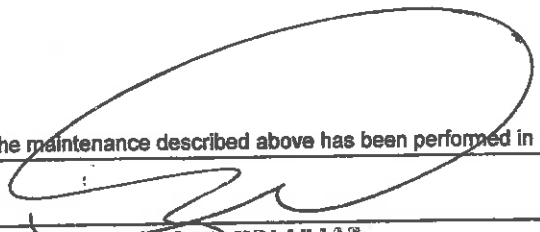
CARRY OUT NDT ON:

- 1 FUEL TANK ASSY , P/N# D4464-041 , J/S# 184178
- 2 FWD CROSSTUBES , P/N# D212-664-101 , J/S# 184695 , 184697
- 2 AFT CROSSTUBES , P/N# D212-664-201 , J/S# 183770 , 183769
- 3 FWD CROSSTUBES , P/N# D350-748-101 , J/S# 184476 , 184478 , 184479
- 2 AFT CROSSTUBES , P/N# D350-748-201 , J/S# 184480 , 184488

Action Taken:						Date:	Initial/Stamp:
LPI C/O IAW ASTM E-1417 REV. 16						OCT 26 2018	
NO CRACK FOUND							
PEN. ZL-56, MPO13600, CLEANER SKC-S MPO13923 , DEV. MPO11715 , UV LIGHT M-20142							

Description	Location	P/N	Qty	Batch	S/N Off	S/N On

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature: 	ACA/SCA Stamp 	Date:
Name: RAFIK MELIKIAS		OCT 26 2018

NCR No. _____

Route update only

Job: _____ Part No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☒		DEPARTMENT/PROCESS Skid-tube ☐ Cross tube ☐ Eng. (Non-AW) ☐ Machining ☐ Small Fab ☐ Prod. Eng. Coord. ☐ Large Fab ☐ Finishing ☐ Rec/Store/Packaging ☐		Engineering ☐ Water Jet ☐ Supplier ☒ Quality ☐	
Date: 18/11/30	Sequence #: 180	QTY Affected: 2		MRB (QSI042) INSP 12 18/10/30			
Description Work Order Deviation				Disposition			
SIS x349 Primer (QSI WOS 4.2.1.3.3) was used instead of Tempo 4500 (4.2.1.3.2). SIS x349 Primer is an aluminum primer, with strontium chromate. Strontium chromate primers are appropriate for steel structures, however adhesion of this primer on cadmium plate is unknown.				Tubes are cadmium plated, which provides corrosion protection. ICA instruct operator to touch up paint finish in the event of paint peeling. Acceptable. 18/10/30			
Root Cause Operator ☒ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐				FAULT CATEGORY Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☒ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled ☐ Other/Details: _____			
				Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread ☐			
				Completed By 18/10/30 Lead hand / Supervisor DAS 9 9-89 QC / QA Coordinator DAS 9 9-89 18-10-31 18-10-31			



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER
PO041524

Supplier: ATE003-VC
Atelier Debosselage
358 Principale
Calumet
QC
J0V 1B0 Canada
Phone: 819 242 5633

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

PO No: PO041524
PO Date: 10/31/18
Due Date: 11/2/18
Purchase Order
Revision:
Revision Date:
Ship-To Contact: Phone:

Via: Ground
Pymt Terms: Net 30
Freight Terms:
Special Comments:

Items											
Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	184483	D350-748-201	Aft Crosstube AS350 / AS355 : TC STC SH06-27 Issue 2, FAA STC SR02359NY 11/03/04, EASA STC EASA.10016903 Revision 2 10/09/03, BRAZIL 2009S04- 04 09/04/06 1-Prime inside and out crosstube as per QSI 005 4.2 2-Paint Outside of Tube as per Dart QSI 005 4.2	Firmed	-	11/2/18	1 pcs	0 pcs	1 pcs	\$225.00/pcs	\$225.00
2	184476	D350-748-101	FWD Crosstube AS350 / AS355 : TC STC SH06-27 Issue 2, FAA STC SR02359NY 11/03/04, EASA STC EASA.10016903 Revision 2 10/09/03, BRAZIL 2009S04- 04 09/04/06 1-Prime inside and out crosstube as per QSI 005 4.2 2-Paint Outside of Tube as per Dart QSI 005 4.2	Firmed	-	11/2/18	1 pcs	0 pcs	1 pcs	\$225.00/pcs	\$225.00
Grand Total:											\$450.00

	Dart Aerospace Ltd. 1270 Aberdeen St Hawkesbury, ON K6A 1K7 Canada Tel (613) 632-5200	PURCHASE ORDER PO041524
Order Notes Procurement Quality Clauses A005 right of entry A012 chemical and physical test report A016 personnel qualification A017 raw material identification (as applicable) A022 Apical Processing A024 process certifications A026 certification of material conformance A041 quality management system A042 dart notification by supplier A043 retention of quality documents A048 counterfeit parts avoidance, detection, mitigation and disposition program A049 supplier awareness Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.		

Plex 10/31/18 10:28 AM dart.tsimiklis.chrisoula

Change Record

PAGE 1 OF 1

Part Number: D350-748-101

Description: CROSSTUBE HIGH FWD

[illegible]